FILED
OCT 20 1998
OFFICE OF THE CLERK
SUPREME COURT, U.S.

No. 97-1709

IN THE

Supreme Court of the United States

OCTOBER TERM, 1997

KUMHO TIRE COMPANY, LTD., *et al.*,
Petitioners,

v.

Patrick CARMICHAEL, *et al.*,
Respondents.

On Writ Of Certiorari to the United States Court Of Appeals for the Eleventh Circuit

BRIEF *AMICI CURIAE* OF THE NATIONAL ACADEMY OF FORENSIC ENGINEERS IN SUPPORT OF RESPONDENTS

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QUESTIONS PRESENTED

1. Whether all expert testimony is subject to the same four "general observations" that dicta in *Daubert* suggested should be applied to novel scientific testimony?

2. Whether expert testimony based on a "generally accepted" methodology that would be admissible under *Frye* should be excluded under Fed.R.Evid. 702, as interpreted by *Daubert*?

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IDENTITY AND INTEREST OF THE *AMICUS CURIAE*

The National Academy of Forensic Engineers (NAFE), founded in 1982, is a Section 501(c)6 non-profit organization of individual engineering practitioners, who are engaged in all fields of engineering.[1] Membership is highly selective and is open only to individual engineers who have demonstrated mastery and maintenance of the highest standards of professional education, training, knowledge, competence, and deportment. Memberships are not available on a corporate, organizational, or governmental basis.

The typical NAFE member has thirty years of experience as an engineer. Many have advanced academic degrees. Each NAFE member is required to be both licensed under the laws of the state in which he practices and registered as a Professional Engineer (PE). Most members are licensed in more tha.. one state and have multi-state PE registrations. Each member must belong to the National Society of Professional Engineers (NSPE) and to a national engineering technical society such as the American Society of Civil Engineers (ASCE), the American Society of Mechanical Engineers (ASME), or the Institute of Electrical and Electronics Engineers (IEEE). In addition to considerable engineering experience past the attainment of the PE license (which typically occurs in the fifth year after the B.Sc. level of engineering education), candidates for NAFE membership are required to demonstrate substantial experience in the application of their engineering knowledge in the jurisprudence system and to provide written recommendations from attorneys or judges familiar with their service to the courts, including their testimony subject to adversary cross examination.

The NAFE is formally affiliated with the NSPE and with the Council of Engineering and Scientific Specialty Boards (CESB), which itself is sponsored by the major interdisciplinary engineering

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1 Pursuant to Rule 37.6, *Amicus* states that no counsel for a party authored this brief in whole or in part, and that no person or entity other than *Amicus* and its counsel made any monetary contribution to the preparation or submission of this brief.

The parties have granted blanket consent to the filing of briefs by *amici* supporting either party. The letters granting this consent are attached to this brief.

organizations of the United States: the NSPE; the Accreditation Board for Engineering Technologies (ABET), which reviews and accredits curricula in university schools of engineering; the National Council of Examiners for Engineering and Surveying (NCEES), which is the umbrella organization for state PE licensing boards and the PE license examination process; and the American Council of Consulting Engineers (ACEC), a multi-discipline trade organization of engineer designer/consultants. The NAFE is a charter member of CESB and, as authorized by CESB, certifies the individual members of NAFE as Diplomates in Forensic Engineering.

The purpose of the NAFE is to provide continuing education and encourage its members to provide objective, unbiased service and ethical practice to the courts and the legal profession. The NAFE does not favor defendants nor plaintiffs. NAFE believes that competent engineering analysis can often be of assistance to the trier of fact and can assist in the work of the legal system. Significantly, NAFE members work for -- and testify on behalf of -- corporations and defendants as often as do for individuals and plaintiffs.

Dennis Carlson, the engineering expert whose testimony was deemed unreliable and inadmissible by the District Court in the case at bar, is not and has not been a member or NAFE, nor is he or has he been a candidate for membership in NAFE. To the best of *Amicus'* knowledge, information, and belief, no NAFE member has any direct economic interest in the outcome of these proceedings.

Nonetheless, *Amicus* is very concerned with the petitioner's thesis that the *Daubert* criteria should be generally or broadly applied to the practice of engineering in the legal system.

SUMMARY OF THE ARGUMENT

This Court showed great faith in the adversary system when it struck down the "general acceptance" requirement for the admissibility of scientific testimony. The use of the trial judges' power under Fed.R.Evid.104 (a) and (b) to act as a gatekeeper applying the criteria of admissibility set forth in *Daubert* was necessary to monitor expert testimony which did not meet the general acceptance requirement as set forth in *Frye v. United States,*

293 F. 1013 (1923) and its progeny. This Court's decision *Daubert* was intended to expand, not limit, admissibility of expert testimony.

Criteria for admissibility of expert testimony crafted to insure reliability for scientific testimony addressed to issues not yet settled in the scientific community are not applicable to engineering and other practice-based disciplines. Where the expert testimony offered meets the more restrictive "general acceptance" criteria, a *Daubert* type analysis is neither necessary nor applicable. There are considerable differences between testimony addressing unresolved issues in epidemiology and an analysis of a tire to determine whether it failed due to a road hazard, misuse, or a manufacturing defect.

The *Daubert* criteria cannot easily be applied to engineering testimony and other practice based disciplines because they fail to give proper weight to the importance of experience and engineering judgment. In the instant case, the trial court disallowed expert engineering testimony based on a visual analysis to determine defect because it felt the opinion subjective and unreliable. The deductive process-of-elimination analysis used by Dennis Carlson, plaintiffs'/respondents' expert, utilized to determine the tire failed due to a manufacturing defect was little different from a differential diagnosis utilized with great success in the medical profession. The methodology used by Mr. Carlson in his engineering analysis was the same used by others experienced in the analysis of tire failures, including the experts employed by the defendants.

It is ironic that this Court's effort to break the shackles of *Frye* is now used as a basis to exclude testimony that would have been admissible under *Frye.* When the trial judge is required to rule on the merits of expert testimony he supplants the role of the trier of fact and places on the parties a burden of proof higher that required in civil cases. In the case at bar, Mr. Carlson, through a deductive process, determined that the most likely cause of tire failure was a manufacturing defect. He gave that opinion based on his training (he had a bachelor's and a master's degree in mechanical engineering from Georgia Tech), and his experience (he was a designer in the tire industry, and had investigated numerous tire failures as a consultant after he left the tire industry). The methodology he utilized for his analysis was the same as that used by engineers and others in the tire industry.

The Eleventh Circuit's decision that the criteria for admission of scientific evidence should not apply to apply to opinion testimony that is based on skill- or experience-based observations is correct and should be affirmed.

ARGUMENT

I. THE *DAUBERT* FACTORS SHOULD NOT RIGIDLY BE APPLIED TO ALL ASPECTS OF ENGINEERING

NAFE members are proud of their academic awards, professional accomplishments, and high standards. Nevertheless, they do not believe that the reliability of all aspects of their work are properly measured by the four "general observations" suggested by this Court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). Indeed, NAFE members are concerned that the so-called "*Daubert* factors" are being rigidly and inflexibly applied to areas of "scientific, technical, and specialized knowledge," Fed.R.Evid. 702, where they do not fit.

Let us be clear. Members of NAFE have no quarrel with the *Daubert* Court's articulation of the now-famous "general observations" for assessing the reliability of scientific testimony. And NAFE members believe that it is entirely appropriate for courts to apply those criteria to the kinds of cutting scientific theories and methodologies that were at issue in *Daubert* and *General Electric Company v. Joiner*, 118 S.Ct. 512 (1997). Both cases involved complex questions of epidemiology in which experts used animal studies to extrapolate a causal relationship between exposure to substances[2] and certain physical conditions suffered by the respective plaintiffs. But such advanced research is only a very small part of the *practice* of engineering and a very much smaller part of the *practice* of engineering that ends in litigation. The members of NAFE investigate tens of thousands of cases involving

[2] In *Daubert*, it was the relationship between Bendectin and birth defects; in *Joiner*, the relationship between PCB and its derivatives and cancer.

questions of the application of engineering technology. Products liability cases are only a small fraction of the totality of engineering related cases.

Although the *Daubert* factors are suitable for *some* scientific testimony -- particularly the kind of novel scientific testimony at issue in *Daubert* and *Joiner* -- those factors are not suitable to all kinds of knowledge and in all cases and certainly should not be applied rigidly in every case and to all types of knowledge. Although petitioners and their *amici* urge this Court to hold that the *Daubert* factors should be applied across the board to all types of scientific, technical, and specialized knowledge, NAFE members think that such a ruling would impose a higher standard on the reliability of testimony than is often used in the actual practices of most professions and intellectual disciplines, particularly engineering. As a result, the application of the *Daubert* factors to all sorts of testimony in all kinds of cases would lead to the exclusion of valuable, valid, and reliable insights.

NAFE members do not know how the framers of Fed.R.Evid. 702 would have defined "scientific, technical, and specialized knowledge" or how they would have defined any one of those terms. *Amicus* suggests, however, that there is no one right answer, no single definition, that describes all scientific enterprises, and no simple interpretation that fits all cases.

Put simply, there is Science and there is science. There is Engineering and there is engineering. Scientists and engineers do not apply the same yardstick in measuring the quality, validity, and reliability of all work that scientists and engineers do. *Amicus* suggests that it would be folly for the Court to impose a universal standard when scientists and engineers use different ones, and folly for the Court to impose higher standards than scientists and engineers do in a particular instance or case.

Although petitioners and their *amici* suggest that all knowledge and all science is a single, gigantic, undifferentiated mass and that one standard does, can, and should be applied to testing the reliability of all testimony proffered under Fed.R.Evid. 702 -- in brief, that "one size fits all" – scientists and engineers everyday apply different standards to different aspects of their work. Indeed,

the same scientist may often apply different standards to different aspects of his or her work, even on the same day.

Albert Einstein illustrates this point very well. Although Einstein is today renowned as the century's most accomplished theoretical physicist, it is generally forgotten that "his first regular job" was much more prosaic: he was an "engineer, Class II at the [Swiss] Federal Patent Office," Ronald W. Clark, EINSTEIN: THE LIFE AND TIMES 68 (1971), a position he held from 1902 to 1908, after he had "completed [his doctoral] thesis" in physics, and while he was "'looking for a position as an assistant lecturer at some university,'" and before he became world-famous. *Id.* at 68, 69 (citation omitted).

During these seven years Einstein led two very different scientific lives. As he described it contemporaneously to a friend, the patent job gave him "'eight hours of work'" and "'eight hours of idleness'" everyday. *Id.* at 75 (citation omitted). He characterized his daytime work as a "'practical profession, '" *id.*; his biographer said that Einstein "saw it mainly as a useful base from which he could begin the self-imposed task of exploring the nature of the physical world." *Id.* at 71.

"Each morning" Einstein "unobtrusively trott[ed] . . . to the Patent Office," where he examined, tested, and analyzed "inventions, ideas, and proposals [which] consisted largely of suggestions for practical, utilitarian, basically simple, and often homely applications of technology to the mundane affairs of everyday life," such as innovations for "typewriters and cameras [and] engineering devices . . . ." *Id.* at 76, 74-75.

"Each evening" Einstein unobtrusively "return[ed] to his lodgings," where he "set[ ] himself down in a quiet corner to discover the laws of nature." *Id.* at 76.

The standards Einstein employed in his vocation and avocation were as different as day and night. By day, at the Patent Office, Einstein was "required to form an *immediate* opinion" on new patents. *Id.* at 70 (emphasis added). "Success was the yardstick and if success were attained by a leavening of by-guess-and-by-God to formal scientific work, [the Patent Office's Chief Engineer] saw little harm in that." *Id.* at 69.

At night, in his lodgings, Einstein undertook *Gedanken Untersuchungen* – "Thought Experiments" -- using nothing more than pencil and paper, while he ruminated over and over on a few deceptively simple questions. Indeed, one such question had preoccupied him for more than ten years, *i.e.*, since 1894, when he was sixteen: what would the world look like, he wondered, if one could travel through space and time while riding on a beam, and at the speed of, light. *Id.* at 41-42. Although he answered that question, at least to his own satisfaction, by devising the Special Theory of Relativity, he did not publish that theory until 1905, *id.* at 74, 113-14, 116-17, and that theory did not receive its first, provisional scientific validation through experimental testing until 1919. *Id.* at 263-64, 284-89. Developing the Special Theory, which, of course, contains the celebrated equation $E=mc^2$, "required" Einstein to do the opposite of what he did during his daytime, "'practical profession,'" that is, not to "form an immediate opinion" on the usefulness of "mundane" things," *id.* at 75,70,74, but to analyze and resolve seemingly and hitherto irreconcilable contradictions among fundamental principles of physics, as exemplified by Newton's Laws of Motion and Lord James Clerk Maxwell's equations of electromagnetism. *Id.* at 101-137.

It seems obvious to NAFE members that Einstein judged the work of theoretical physicists, like Newton and Maxwell, on the one hand, and the work of inventors who sought patents on the basis of their practical application of well-established physical theories, on the other hand, by vastly different standards. He subjected the former to endless and exacting scrutiny. He measured the latter more quickly and more leniently: as noted above, "[s]uccess was the yardstick and if success were attained by a leavening of by-guess-and-by-God to formal scientific work, [the Patent Office's Chief Engineer] saw little harm in that." *Id.* at 69.

It also seems obvious that the different types of work that Einstein undertook also were tested by different standards. His superiors at the Patent Office assayed his work for speed and "useful[ness]," *id.* at 73, not for deliberation and thoroughness. By contrast, his fellow theoreticians assayed his equations and proofs for their accuracy, predictive value, and completeness. Although, Einstein's Special Theory received initial experimental confirmation

in 1919, fourteen years after Einstein published it, that theory remains controversial to this day, at least as to its completeness. Indeed, Einstein devoted the final four decades of his life unsuccessfully trying to devise a more accurate and complete Unified Field Theory, one that would "'connect[ ] gravitation and electricity.'" *Id.* at 493 (citation omitted). *See id.* at 491-96, 742-45.

It is obvious that not every scientist or engineer is an Einstein. It is equally obvious that almost any scientist or engineer can and often does wear different hats at different times or even at the same time. Thus, although as the National Academy of Engineering and the Rubber Manufacturers Association are correct in explaining that tire failures can be subject to very sophisticated, comprehensive, and time-consuming forms of analysis, this hardly means that all such failures either routinely are or routinely should be subjected to the most exacting scrutiny. Nor does the fact that tire failures can be tested by the gold standard mean that anything less than the gold standard is beyond the scientific pale.

The experience of NAFE members shows that the kind and level of engineering/scientific analysis undertaken by a given professional at a given time varies, necessarily, with the question he is asked to answer. As Carlson explained, when he was employed at Michelin he was asked different types of questions and given different types of assignment at different times. Sometimes he was asked to discover and explain why a particular tire, such as one that had been returned to a dealer by a disgruntled customer, had failed. At other times, he was given the task of analyzing why a particular brand, model, or design of tire was repeatedly failing. The stakes, for the company, were usually much greater for the latter than for the former and, understandably called for a different, higher, more sophisticated, lengthier, and more expensive level of testing and analysis.

A. The *Daubert* Court Limited Its Analysis of Fed.R.Evid. 702 to a "Scientific" Context

In *Daubert*, this Court limited its analysis of Fed.R.Evid. 702 to that portion that refers to "scientific" knowledge: "Rule 702 applies to 'technical, or other specialized knowledge.' Our

discussion is *limited* to the scientific context because that is the nature of the expertise offered here." *Daubert*, 509 U.S. at 590, n. 8 (emphasis added). "In a case involving scientific evidence, *evidentiary reliability* will be based upon *scientific validity*." *Id.*, 509 U.S. at 590, n. 9 (emphasis in the original).

Amicus respectfully submits that in cases involving engineering evidence, evidentiary reliability should be based on *engineering validity*. There is a significant difference between expert testimony concerning matters not yet settled in the scientific community and testimony concerning the cause of a tire failure. The *Daubert* analysis, incorporates the basic elements of the scientific method. *Daubert*, 509 U.S. at 542-43. The scientific method is used to prove conclusive facts by reproducible experimentation. A party's burden in a civil case is considerably less than that. Additionally, such experimentation and the review process attendant thereto is not feasible in most engineering cases.

II. RIGID APPLICATION OF THE *DAUBERT* FACTORS TO ENGINEERING TESTIMONY FAILS TO GIVE SUFFICIENT WEIGHT TO THE IMPORTANCE OF EXPERIENCE AND THE ENGINEERING JUDGMENT BASED ON THAT EXPERIENCE.

An engineer's ability to apply his or her education comes with experience. Basic academic knowledge becomes useful to an engineer through an understanding, gained by experience, of the relationships between materials as they act in the real world, and the interplay of energies and forces as they actually govern the performance of devices and processes. It is no accident that industrial corporations, government agencies, and engineering firms alike prefer to hire engineers who have received only baccalaureate degrees, rather than advanced degrees, not because the private and governmental organizations that hire new engineers discount the value of advanced academic training, but rather because they believe such training is useful only if newly-minted engineers have been "seasoned" with experience. Thus, these organizations hope and expect (even where they do not require) that engineers with B.Sc. degrees will earn advanced degrees through part-time "after work"

studies. The competent practice of engineering, the *art* of engineering, is largely dependent upon experience gained in the practice of engineering and should not be excluded from expert testimony. In many respects it is the most valuable information that the engineer can bring to the courtroom.

To mandate a single set of overriding criteria (devised as test standards for acceptance of novel theories related to biological/medical research) and to require the application of those criteria to engineering testimony would deny the trier of fact in engineering related cases the competent judgment of engineers engaged in the actual practice of engineering. NAFE opposes the application of *Daubert* to engineering testimony, excepting those very few matters which involve new and novel theory originally researched. In the vast majority of engineering cases the testing process mandated in original or novel research is simply not feasible, because the object at issue is unique or has failed or been impaired or is incidental to some process leading to accident or failure and is not reasonably reproducible. Double blind experiments followed by peer-reviewed publication and verification by other researchers is an admirable process for testing of novel scientific/medical theory, but unrelatable to the real would of accidents and material or system failures where most engineers work. Also, such extensive experimentation, if required within the time strictures and economic limitations of the legal system as a *sine qua non* for engineering testimony, simply would prevent the availability of competent testimony to assist the trier of fact. It appears that this would subvert and defeat the intent of Fed.R.Evid. 702.

The courts, by applying sensible constraints on engineering testimony in accord with the more restrictive *Frye* doctrine, would be able to provide the trier of fact with the engineering assistance that they need and can best use. That some individual expert might seek to venture beyond his competence is a failing not to be denied, but is probably less (not more) prevalent in the domain of engineering testimony in the courts than by others elsewhere in our society. However, the engineering profession through professional licensing (State PE registration) which is revocable for violation of legally mandated codes of conduct and by exposition and peer

pressures tends strongly to minimize improper actions by engineers. The engineering profession looks with pride and respect to the "Code of Ethics for Engineers" of the National Society of Professional Engineers (NSPE), the "Code of Ethics" of the American Society of Civil Engineers (ASCE), and numerous such codes set forth by literally hundreds of disciplines and specialty-specific engineering societies.

A. Engineering Consideration in Design

Although there is no question that in many, if not most, design considerations, the engineer may or will make use of well-established analytical techniques, methods, tests, and mathematical tools to determine certain physical characteristics of a product, device, or structure, that is not the end of the design process. It is usually only the beginning.

Unlike science, engineering always involves (except for a few instances not relevant here) a balance of competing trade-offs that are essential in order to complete the design of the product, the device, or the structure.

Design constraints, such as usefulness, weight, strength, cost, manufacturability, serviceability, safety, foreseeabilty of misuse, and intended uses, can be *incompatible* requirements of a component. For example, not only will adding more safety devices increase the cost of the item, but the utility of the product may be eroded or the serviceability may be compromised. If the strength is increased to accommodate a greater range of foreseeable misuses, the cost and usefulness may be compromised or additional hazards may be introduced.

Thus the design process ends only when and if the engineer has reached a balance of these competing considerations using, perhaps, reduction of hazards from all reasonably foreseeable use situations, as the premise for completing the design. Alternatively, the engineer may be constrained to design at the lowest possible cost or the least possible weight, or complete the design using some other constraint.

Regardless of the constraint the engineer chooses or is required to use to complete the design, it is not based on a "scientific" methodology. And when the allegation is that of a design defect or

a manufacturing defect, the battleground between opposing experts is *not* the "scientific" principles used to calculate the strength of a critical component, for example, but, rather the constraint chosen to complete the design, e.g. the cost of the item or, perhaps, the failure to address an appropriate range of foreseeable uses or the product's failure to meet design specifications. There are no "peer-reviewed" publications that discuss the "proper" means of balancing completing design constraints. It is a matter of postulating the characteristics of the product users, together with the uses and misuses to which they put the product within the environments that the product foreseeably will be used, so as to reduce or eliminate the resultant risks of injury.

The plaintiff's expert will argue for a different balance of those competing considerations that leads to that expert's proposed alternative to the existing design. The ability of a plaintiff's expert to answer relevant questions regarding such matters as altered cost, utility, or marketability, associated with the proposed design alternatives, are most appropriately the subject for cross-examination, not for barring the testimony in the first place. As long as the expert has satisfied the court that she/he has the appropriate qualifications to address the relevant issues and that he/she employs the standard methodologies used in the field to answer the particular question posed in the case, the expert should be permitted to testify.

Engineering judgment always plays an important role in engineering design and analysis. Two engineers with similar training and backgrounds can look at the same problem, apply the same methodology, and have different opinions as to the solution. When that occurs in a litigation context, the best solution is the one espoused by this Court in *Daubert:* "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." *Daubert,* 509 U.S. at 596.

The adversarial system is better equipped today to deal with experts who offer questionable testimony than it ever has been. This is the information age. With a key stroke one can find an immense amount of information about a potential expert witness. Listing of prior testimony and prior publications are part of the required disclosure of expert witnesses under Fed.R.Civ.P. 26(a). Access to

transcripts, patent searches, literature searches, and other background investigation is as close as the computer on a counsel's or consultant's desk.

III. THE METHODOLOGY EMPLOYED BY THE PLAINTIFFS'/RESPONDENTS' EXPERT DEMONSTRATED ITS RELIABILITY WHEN VIEWED IN THE CONTEXT IN WHICH IT WAS GIVEN.

This case exemplifies the problems that can be created when a court attempts to analyze a particular method of analysis without adequate knowledge of the methodologies utilized in the particular field in which the opinion is being offered. *Amicus* shares Chief Justice Rehnquist's view that Rule 702 "imposes on [trial judges] neither the obligation nor the authority to become amateur scientists in order to perform that role." *Daubert*, 509 U.S. at 600-01.

Here the methodology employed by Mr. Carlson was the same as employed by others in his field. In the case at bar, the expert, through a deductive process, determined that the most likely cause of a tire failure was a manufacturing defect. He gave that opinion based on his training (he had a bachelor's and a master's degree in mechanical engineering from Georgia Tech), and his experience (he was a designer in the tire industry, and had investigated numerous tire failures as a consultant after he left the tire industry). The methodology he utilized for his analysis was the same as that used by engineers and others in the tire industry, including the defendant's own experts. The trial court approved of Carlson's "process-of-elimination form of proof," recognized that he employed a methodology to reach his conclusions, but simply did not believe the method was reliable. *Carmichael v. Samyang Tires, Inc.*, 923 F. Supp. 1514, 1521 (S.D.Ala. 1996). Conversely, the Eleventh Circuit approved of the same methodology:

> Carlson rests his opinion on his experience in analyzing failed tires. After years of looking at the mangled carcasses of blown-out tires, Carlson claims that he can identify telltale markings revealing whether a tire failed because of abuse or

> defect. Like a beekeeper who claims to have learned through years of observation that his charges always take flight into the wind, Carlson maintains that his experiences in analyzing tires have taught him what "bead grooves" and "sidewall deterioration" indicate as to the cause of a tire's failure.

Carmichael v. Samyang Tire, Inc., 131 F.3d 1433, 1436 (11th Cir. 1997).

The Eleventh Circuit came to its conclusion based on its observation that the petitioners' experts had relied on the same markings and analytical methodology for their analysis as Mr. Carlson did for his. 131 F.3d at 1436 n. 8.

Thomas M. Dodson, Samyang's expert, 923 F. Supp. at 1524, has made it quite clear that the tools used to determine why a tire failed are not sophisticated, "tread measuring device, hand held magnification, cameras and things of that nature for documentation purposes. Nothing terribly sophisticated." Deposition of Thomas M. Dodson, *Vasquez v. Uniroyal Goodrich Tire Co.,Inc.*, 138 Judicial Dist. Ct, Cameron County, Tex., Cause No. 96-02-694-B ()ct. 15, 1997) at 6. (A true and correct copy of this deposition has been lodged with the Clerk of the Court has Exhibit A to this Brief).

> A: Well, I can't speak for the whole tire industry, but for anybody I've ever come in contact with, the visual/tactile examination is usually the technique of choice.
> Q: And it is accepted as a reliable and accurate way to determine?
> A: Depends on who's doing the examining, sir.
> Q: That's right.
> A: If used properly I think it is a valid technique.
> Q: So if a person is qualified, has the experience such as your experience, the technique certainly can be reliable and accurate in determining the causes of a tire failure?

> A: I think the- technique, if used properly, comparison/observation to conclusion technique is a valid technique. I can't address any particular individual using that technique without some knowledge of who that individual is. You know, some people take the tool and use them totally inappropriately, doesn't make the tools bad.

Id. at 21-22.

Tellingly, neither at trial, before the Eleventh Circuit, or before this Court, have petitioners' (or their *amici*) controverted Carlson's assertion that their experts used the same methodology that he did. The most they have said is that other, better, more accurate, more reliable tests are available – not that such tests are ever used in the context of the question to experts for both parties *in this case*: what caused the failure of the particular tire that exploded on the Carmichael van – customer abuse or a design or manufacturing defect?

The fact is that the methodology Mr. Carlson used is identical to that used in the tire industry *generally* to analyze tire failures. *Amicus* has lodged with the Clerk of Court affidavits, and trial and deposition transcripts providing the sworn testimony of individuals from the tire industry, experts testifying on behalf of the tire industry and other tire failure experts, all indicating that they use a visual technique and the process-of-elimination as their primary method to determine whether a tread separation and resulting tire failure occurred do to defects in manufacture or design verses consumer abuse or a road hazard.

In addition, *Amicus* has also lodged with the Clerk, as Exhibit B, the affidavit of Mr. H. R. Baumgardner. Mr. Baumgardner spent twenty-seven years of his professional life as a tire engineer at Firestone Tire and Rubber Company. He has considerable experience in tire design, industry-based analysis of tire failures in both a test environment and field environment, and forensic analysis of tire failures in a litigation setting. According to Mr. Baumgardner's affidavit:

> 7. A determination of whether tread separation or tread belt separation in a steel belted radial tire is due to manufacturing, design defects, or abuse is a relatively simple undertaking for *experienced* tire engineers that is accomplished primarily by visual and tactile inspection. Infrequently x-ray examination of a tire is utilized to confirm findings on a visual examination.
>
> 8. Tire engineers and tire rubber chemists, when analyzing the results of their own experimental test tires run on laboratory and fleet tests, rely almost entirely on visual examination of the failed surfaces for determination of the cause of the failure. I was present for thousands of reports by Firestone engineers and chemists who reported to management regularly at Fleet Meetings. Virtually none of these reports required more extensive analysis or examination. The criterion was usually did the tire perform as expected and if it failed, where did it fail and was a construction weakness evident.

Baumgardner Aff., at 1-2 (emphasis added).

As Mr. Baumgardner indicates, determining the exact nature of manufacturing defect can be elusive for several reasons. Conversely, the lack of adhesion resulting in tread and outer belt separation of radial tires *is* a "manufacturing defect that has caused many serious and fatal accidents."

> 12. This manufacturing defect can most often be determined by the process of elimination whereby the potential causes of tread separation are systematically eliminated by visual examination. If an

> examiner finds no evidence of external damage or other external causes of tread separations, such as problems of extreme overloading or under inflation, etc., and evidence is present of propagation of the separation in the normal service one can conclude that such tread separation is the result of improper adhesion as a result of a manufacturing defect.

Baumgardner Aff., at 2.

One characteristic Mr. Carlson, Mr. Baumgardner, and Mr. Dodson have in common is that they are well qualified. Mr. Carlson's qualifications are not questioned here. An expert's outstanding qualifications provide "circumstantial evidence" that the expert has employed a sound methodology. *Ambrosini v. Labarraque*, 101 F.3d 129 (D.C. Cir. 1996)

The Official Comments to Fed.R.Evid.702, at page 13 makes the pragmatic observation that the lesson to be learned from the cases following *Daubert* is: "If the methodology is good enough for the real world, it is good enough for a trial." Stephen A. Saltzburg, Daniel J. Capra, and Michael M. Martin, *Commentary*, U.S.C.S. Fed. R. Evid. 702 (1998), at 13.

IV. TESTIMONY THAT WOULD HAVE BEEN ADMISSIBLE UNDER A *FRYE* ANALYSIS SHOULD NOT BE EXCLUDED UNDER A *DAUBERT* ANALYSIS.

It is ironic that testimony which would have met the test in *Frye v. United States*, 293 F. 1013 (1923), should be excluded under a *Daubert* analysis. The rules for admissibility set forth in *Frye* differ from Rule 702 only to the extent *Frye* requires that the proffered testimony represent deductions made from principles which had "gained general acceptance" in a particular field.

> The rule is that the opinions of experts or skilled witnesses are admissible in

evidence in those cases in which the matter of inquiry is such that inexperienced persons are unlikely to prove capable of forming a correct judgment upon it, for the reason that the subject-matter so far partakes of a science, art, or trade as to require a previous habit or experience or study in it, in order to acquire a knowledge of it. When the question involved does not lie within the range of common experience or common knowledge, but requires special experience or special knowledge, then the opinions of witnesses skilled in that particular science, art, or trade to which the question relates are admissible in evidence.

Numerous cases are cited in support of this rule. Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

Frye, 293 F. at 1014.

If Mr. Carlson's opinions are analyzed in the context of the field of mechanical engineering and the analysis of tire failures, it is quite clear that Mr. Carlson's opinions were made by "deductions" based on principles that find "general acceptance" in the field of mechanical engineering. The trial court failed to give sufficient weight to the ability of an expert to express an opinion to a reasonable engineering probability based solely of the use of his

senses. Mr. Carlson's methodology to determine whether tire failure was caused by a manufacturing defect verses a road hazard or abuse is little different from the differential diagnoses utilized by physicians.

It does not make sense that a rule that was intended to expand the admissibility of expert testimony is now being used to exclude testimony that would never have been challenged under *Frye*. The irony, that parties would claim that *Daubert* "raised the bar of admissibility," was specifically addressed by the Sixth Circuit in *United States v. Jones*, 107 F.3d 1147, 1158 (6th Cir.), *cert. denied*, 117 S. Ct. 2527 (1997).

> As we implicitly recognized in *Berry [v. City of Detroit*, 25 F.3d 1342, 1349-50 (6th Cir.1994)], *Daubert* does not create a new framework for analyzing proffered expert testimony based upon "technical, or other specialized knowledge." *Daubert* provides a "flexible" framework to aid district courts in determining whether expert scientific testimony is reliable. If that framework were to be extended to outside the scientific realm, many types of relevant and reliable expert testimony -- that derived substantially from practical experience -- would be excluded. Such a result truly would turn *Daubert, a case intended to relax the admissibility requirements* for expert scientific evidence, on its head.

Jones, 107 F.3d at 1158 (emphasis supplied.)

V. THE MISAPPLICATION OF THE *DAUBERT* STANDARD TO ENGINEERING TESTIMONY

Amicus' concern about the rigid application of the *Daubert* principles to engineering testimony is best evidenced by the result in a case not currently before the court. In *McKendall v. Crown Corporation*, 122 F.3d 803 (9th Cir. 1997), the trial court had, based on a *Daubert* challenge, excluded the testimony of a mechanical and metallurgical engineer who had been working in the field of product design, product development, and product safety for over 50 years and had been a professor of mechanical engineering for 33 years. The case did not concern any novel scientific issue. It was a products liability case involving a specialized version of an industrial forklift truck called a "stockpicker." The engineer had offered the opinion that the stockpicker was defectively designed because it did not adequately protect the operator. He proposed an interlock barrier to be installed between the operator and the load. The engineer's testimony was excluded by the trial court because the court felt that the engineer had not sufficiently demonstrated that the proposed gate was feasible, that it would not impede the pickers proposed use, and that it would increase the overall safety of the vehicle. *McKendall*, 122 F.3d at 805.

The Ninth Circuit correctly reversed the trial court, finding the principles of *Daubert* inapplicable to the proffered testimony:

> McKendall does not contend that Siegel's testimony would withstand an application of the *Daubert* factors. Rather, he argues that the district court erred in applying the *Daubert* factors to Siegel's testimony since Siegel's testimony was not based on "scientific" knowledge. McKendall asserts that Siegel's testimony is based on his experience as a mechanical engineer who has investigated hundreds of forklift accidents. He argues that Siegel has "technical, or other specialized knowledge" described in Rule 702, and to which the *Daubert* factors, applicable to scientific knowledge, do not apply. Thus, he proposes that Siegel's testimony should have been admitted under Rule 702, as Siegel demonstrated through experience, training, and education his familiarity with forklifts. Furthermore, he argues, this technical or other specialized knowledge would have assisted the trier of fact to understand the evidence and to determine facts in issue, consistent with Rule 702.

McKendall, 122 F.3d at 806.

Significantly, unlike the testimony of the plaintiffs' experts in *Daubert* and *Joiner*, the engineering testimony offered in *McKendall* involved basic principles of mechanical engineering design that were neither novel nor untried. *See also Compton v. Subaru of America, Inc.*, 82 F.3d 1513, 1515, 1519 (10th Cir.), *cert. denied*, 117 S. Ct. 611 (1996) (defendant manufacturer tried unsuccessfully to use *Daubert* criteria to exclude clearly competent expert testimony submitted by an aerospace and mechanical engineer who had 22 years experience in automotive design, where the issue was the design of the roof and its failure to provide acceptable occupant protection). *McKendall* and *Compton* are but a few of the many instances trial judges have struggled trying to apply a standard developed to monitor novel scientific evidence to real world every day use of engineering experience and judgment. The analysis should fit the discipline from which the opinions are drawn.

CONCLUSION

This Court should affirm the decision of the Eleventh Circuit Court of Appeals concluding that the *Daubert* factors do not form an appropriate basis for evaluating the admissibility of opinion testimony that is based on skill or experience based observations. Engineering testimony which would been admissible under the more restrictive *Frye* standard should not be excluded. *Amicus* respectfully urges this Court to recognize the important role that experience and engineering judgment play in opinion testimony

concerning engineering matters. In cases involving engineering evidence, evidentiary reliability should be based on *engineering validity*.

Respectfully submitted,

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